

WHAT IS CLAIMED IS:

1. An integrated voltage controlled oscillator comprising:
  - a first slab inductor having two ends;
  - 5 a second slab inductor having two ends;
  - a first oscillator core coupled to a first end of the first slab inductor and a second end of the second slab inductor; and
  - a second oscillator core coupled to a second end of the first slab inductor and a first end of the second slab inductor.
2. The integrated voltage controlled oscillator of claim 1 wherein the first slab inductor and the second slab inductor are parallel to each other.
3. The integrated voltage controlled oscillator of claim 1 further comprising:
  - a third slab inductor having two ends;
  - 20 a third oscillator core coupled to a first end of the third slab inductor and the second end of the second slab inductor; and
  - wherein the first oscillator core is coupled to a second end of the third slab inductor and the first end of the first slab inductor.

4. The integrated voltage controlled oscillator of claim 1 further comprising:

a third slab inductor having two ends;

a fourth slab inductor having two ends;

5 a third oscillator core coupled to a first end of the third slab inductor and the second end of the second slab inductor;

a fourth oscillator core coupled to a second end of the third slab inductor and a first end of the fourth slab  
10 inductor; and

wherein the first oscillator core is coupled to a second end of the fourth slab inductor and the first end of the first slab inductor.

15 5. The integrated voltage controlled oscillator of claim 1 wherein the oscillator cores are selected from one or more of the group comprising an NMOS oscillator core, a PMOS oscillator core, a complementary oscillator core, and a noise shifting differential Colpitts oscillator core.

20

6. The integrated voltage controlled oscillator of claim 4 further comprising a virtual ground coupled to a middle point of each slab inductor.

25 7. The integrated voltage controlled oscillator of claim 6 wherein the virtual ground comprises a conducting element coupled to the middle point of each slab inductor.

8. The integrated voltage controlled oscillator of  
30 claim 4 further comprising a pick-up loop disposed within the four slab inductors, wherein the oscillator signal is induced in the pick-up loop.

9. The integrated voltage controlled oscillator of claim 1 further comprising a first resonant tank capacitor in parallel with the first oscillator core and a second resonant tank capacitor in parallel with the second  
5 oscillator core.

10. The integrated voltage controlled oscillator of claim 9 wherein the slab inductors each have a shape selected from one of the group comprising a rectangle, a  
10 curve, an "L" shape, and a "U" shape.

11. A method for providing a voltage controlled oscillator signal in an integrated circuit comprising:

coupling a plurality of oscillator cores via slab inductors that are used to provide a tank resonance  
5 inductance for the oscillator cores;

exciting the oscillator cores at an oscillation frequency; and

receiving the oscillator signal from a pick-up coil that is inductively coupled to the slab inductors.  
10

12. The method of claim 11 further comprising cross-connecting the slab inductor center points to suppress parasitic modes of oscillation or self-induced dc latching.

13. The method of claim 11 wherein coupling the plurality of oscillator cores via the slab inductors further comprises selecting the oscillator cores from one or more of the group comprising an NMOS oscillator core, a PMOS oscillator core, a complementary oscillator core, and a  
15 noise shifting differential Colpitts oscillator core.  
20

14. The method of claim 11 wherein driving the oscillator cores at the oscillation frequency comprises adjusting a voltage level to change the oscillation  
25 frequency of the oscillator cores.

15. The method of claim 11 further comprising providing a capacitor in parallel with each oscillator core.

16. The method of claim 15 wherein each capacitor is selected from the group comprising a resonant tank capacitor, a varactor, and a switched capacitor bank.  
30

17. An integrated voltage controlled oscillator comprising:

two or more slab inductors, each having a first end and a second end;

5 two or more oscillator cores coupled to a first end of one of the two or more slab inductors and a second end of another of the slab inductors; and

wherein the slab inductors and the oscillator cores form a continuous circuit.

10

18. The integrated voltage controlled oscillator of claim 17 wherein the oscillator cores are selected from one or more of the group comprising an NMOS oscillator core, a PMOS oscillator core, a complementary oscillator core, and a  
15 noise shifting differential Colpitts oscillator core.

20

19. The integrated voltage controlled oscillator of claim 17 further comprising a virtual ground coupled to a middle point of each slab inductor.

20. The integrated voltage controlled oscillator of claim 17 wherein the virtual ground comprises a conducting element coupled to the middle point of each slab inductor.

25

21. The integrated voltage controlled oscillator of claim 1 further comprising a pick-up loop disposed within the slab inductors, wherein the oscillator signal is induced in the pick-up loop.

30

22. The integrated voltage controlled oscillator of claim 1 further comprising a resonant tank capacitor in parallel with each oscillator core.

23. The integrated voltage controlled oscillator of claim 1 further comprising one or more resonating tanks inductively coupled to each oscillator.

5        24. The integrated voltage controlled oscillator of claim 23 wherein the resonating tanks are disposed adjacent to each oscillator.

10       25. The integrated voltage controlled oscillator of claim 23 wherein the resonating tanks further comprise two or more slab inductors, each having a first end and a second end.

15       26. The integrated voltage controlled oscillator of claim 23 wherein the resonating tanks further comprise:

      two or more slab inductors, each having a first end and a second end; and

      one or more capacitor in series with the two or more slab inductors.

20

27. An integrated voltage controlled oscillator system comprising:

a first voltage controlled oscillator further comprising;

5 a first slab inductor having two ends;  
a second slab inductor having two ends; and  
a first oscillator core coupled to a first end of  
the first slab inductor and a second end of the second  
slab inductor;

10 a second voltage controlled oscillator further comprising:

a third slab inductor having two ends;  
a fourth slab inductor having two ends; and  
a second oscillator core coupled to a first end of  
15 the third slab inductor and a second end of the fourth  
slab inductor; and

wherein the first voltage controlled oscillator and the  
second voltage controlled oscillator are inductively  
coupled.

20

28. The integrated voltage controlled oscillator  
system of claim 27 wherein the first voltage controlled  
oscillator further comprises a third oscillator core coupled  
to a second end of the first slab inductor and a first end  
25 of the second slab inductor.

29. The integrated voltage controlled oscillator  
system of claim 27 wherein the slab inductors are L shaped.

30. The integrated voltage controlled oscillator system of claim 27 wherein the slab inductors each further comprise:

- a first straight portion; and
- 5 a second straight portion perpendicular to the first straight portion and coupled to the end of the first straight portion.